

No. 798,097.

PATENTED AUG. 29, 1905.

B. A. GRASBERGER.
TROLLEY STAND.

APPLICATION FILED DEC. 12, 1904.

FIG. 1.

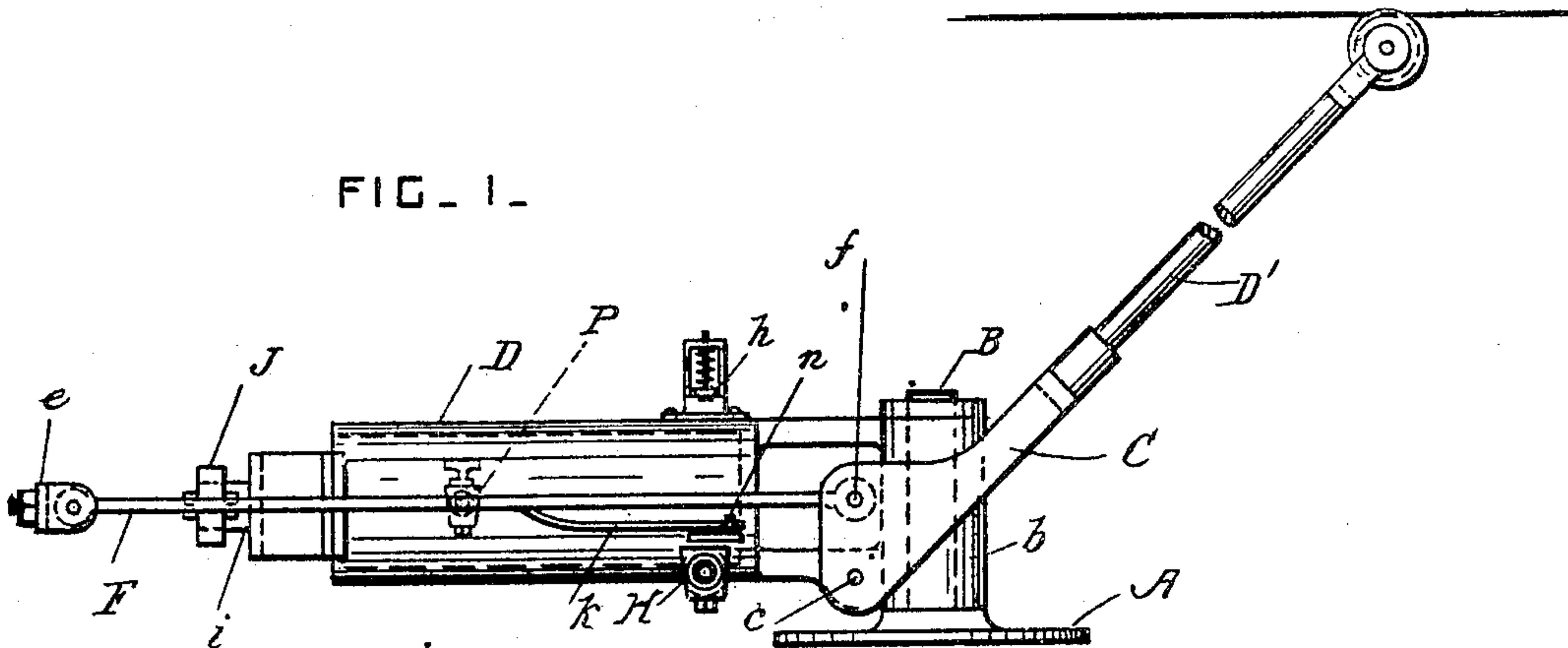


FIG. 2.

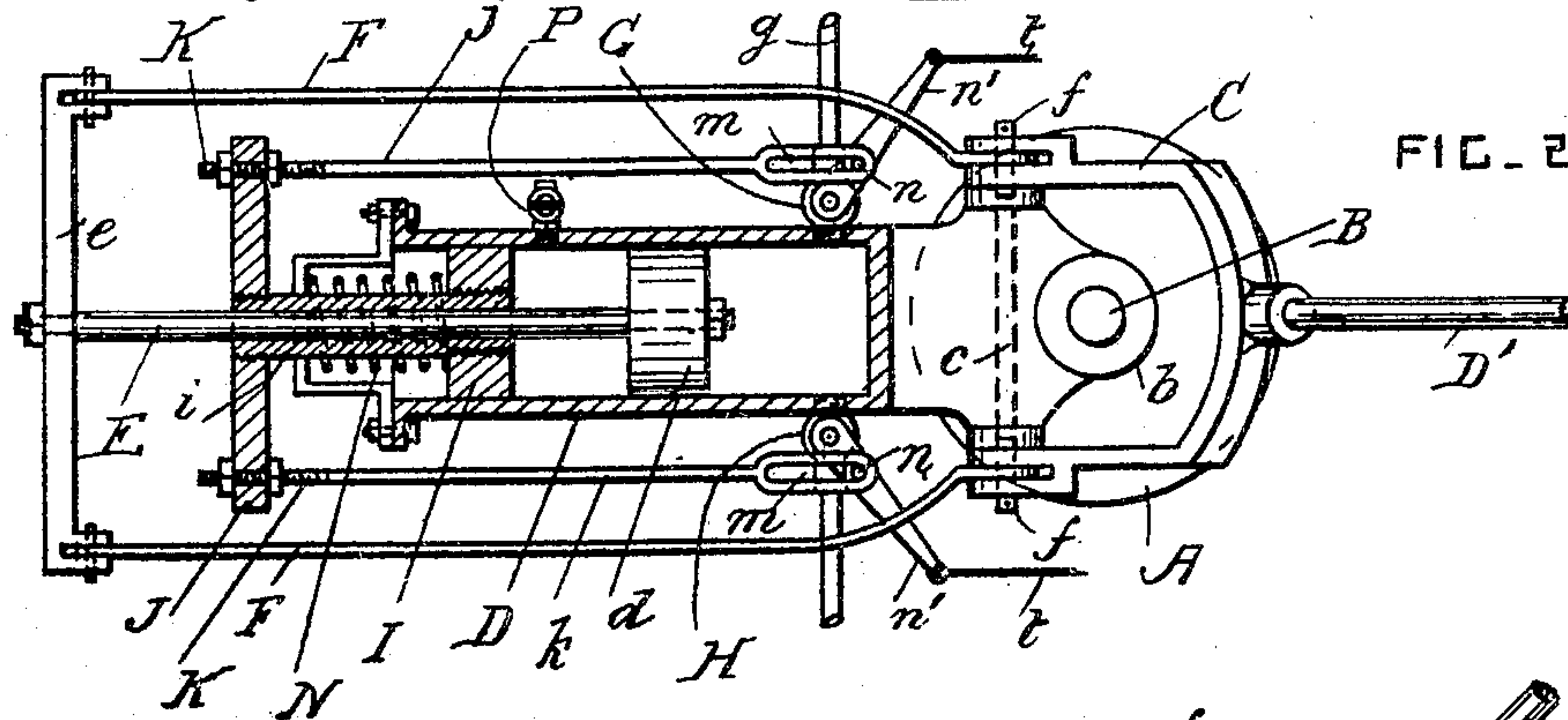


FIG. 3.

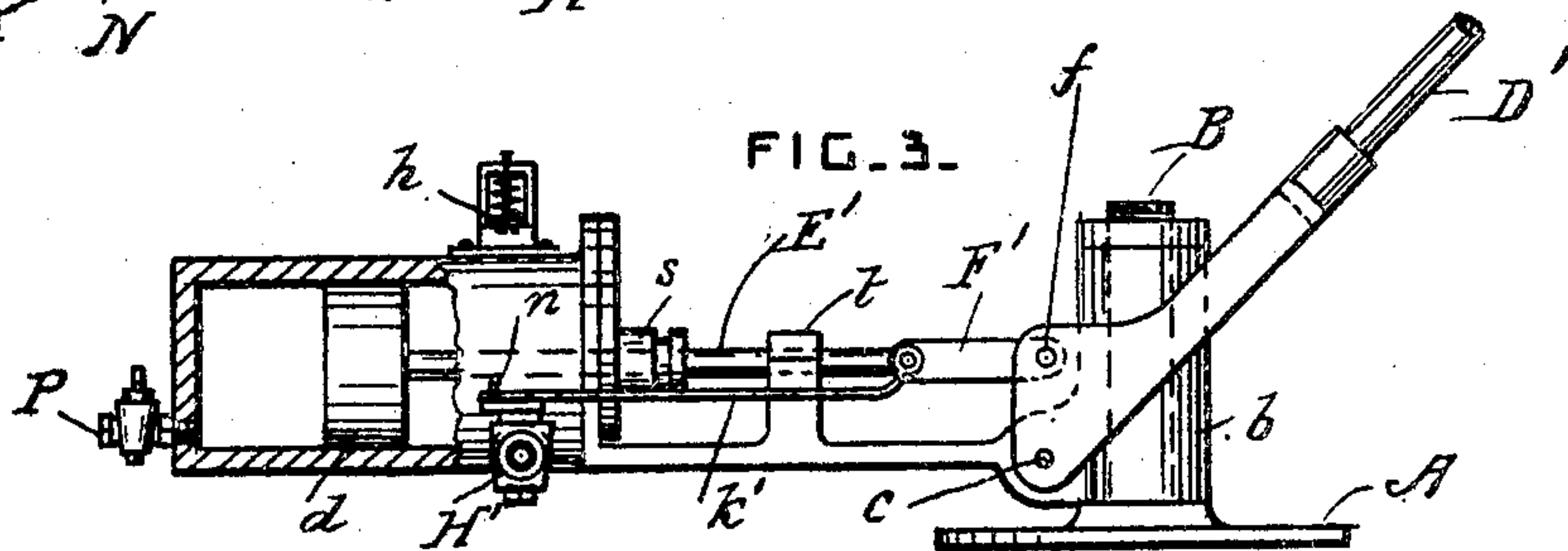
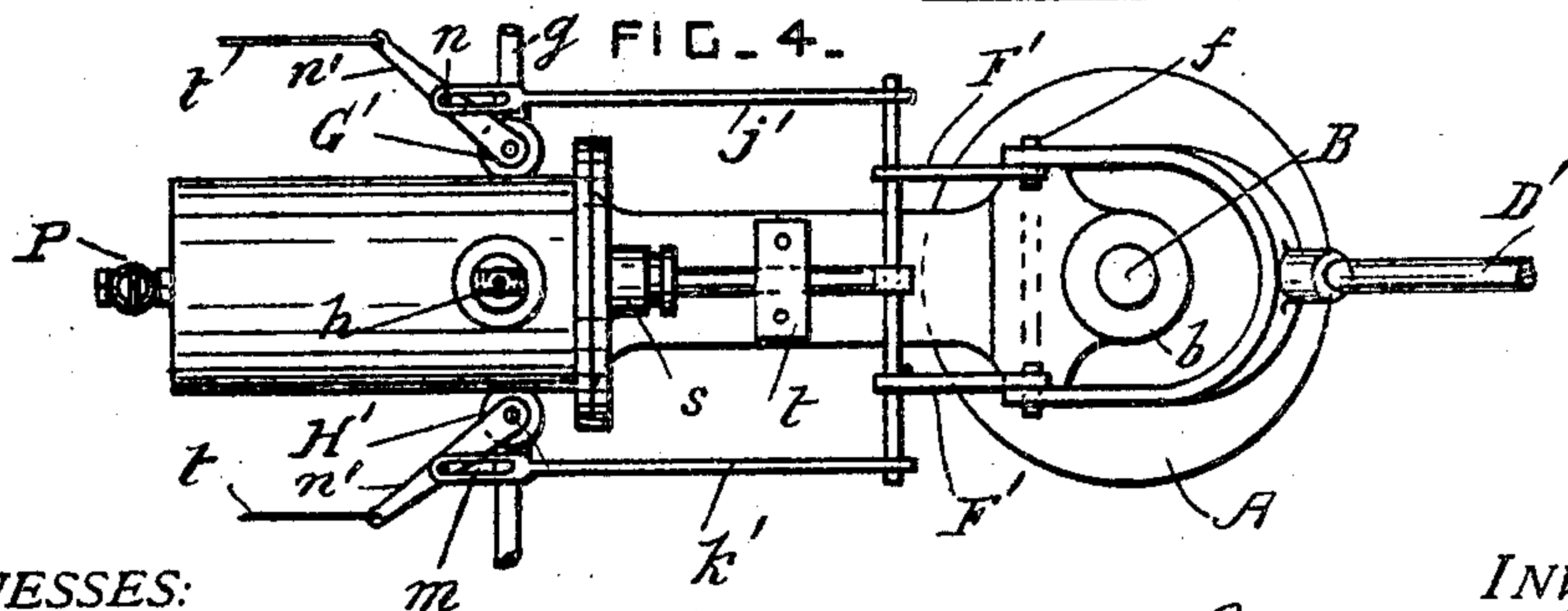


FIG. 4.



WITNESSES:

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TROLLEY-STAND.

No. 798,097.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed December 12, 1904. Serial No. 236,578.

To all whom it may concern:

Be it known that I, BONIFACE A. GRASBERGER, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Trolley-Stands; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to stands for the trolley-poles of electric railroads; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view of a trolley-stand constructed according to this invention. Fig. 2 is a plan view of the same, partly in section. Fig. 3 is a side view showing a modification of the trolley-stand shown in Figs. 1 and 2. Fig. 4 is a plan view, partly in section, of the trolley-stand shown in Fig. 3.

A is a stationary base which is secured to the top of the car, and B is a pivot which projects upwardly from the said base. A socket *b* is pivoted on the pin B; but the socket and base may be pivotally connected in any other approved manner.

C is a forked arm which is pivoted to the socket *b* by a pin *c*, and D' is a trolley-pole of any approved construction secured to the said arm.

D is an air-cylinder which is arranged horizontally and secured to the socket *b*. A piston *d* is slidable in the cylinder D and provided with a piston-rod E. The piston-rod E is secured to a cross-head *e*, and F represents connecting-rods pivoted to the ends of the cross-head *e* and to pins *f*, carried by the forked arm C and arranged above the pivot-pin *c* of the said arm.

G is the air-inlet valve, and H is the air-outlet valve. These two valves are of any approved construction and are secured to the front end portion of the cylinder D. The inlet-valve G is connected, by means of a flexible pipe *g* or any other approved connection, with a reservoir of compressed air. When the car is provided with an air-brake, the reservoir used in connection with the air-brake is preferably utilized; but when the car is not provided with an air-brake special means (not

shown) have to be provided for obtaining a constant supply of compressed air for use in the cylinder D.

The front end portion of the cylinder D is also provided with an air-relief valve or safety-valve *h* of any approved construction, which may be operated in any approved manner to let the air out of the cylinder D suddenly and without operating the valves G and H. This relief-valve *h* is used when the trolley-pole is forcibly lowered to permit it to pass under a low bridge and in other similar situations.

I is a governor-piston which is slidable in the rear end portion of the cylinder D. This piston I is secured to a tubular piston-rod *i*, which is slidable on the piston-rod E, and J is a cross-head secured to the projecting rear end portion of the tubular piston-rod *i*. The cross-head J is operatively connected with the two valves G and H by rods *j* and *k*. Each of these rods is provided with a screw-threaded portion K and nuts, by means for which it is connected to the cross-head and which afford a means for adjusting its length. Each rod is also provided with a longitudinal slot *m*, which engages with a pin *n* on the operating-arm *n'* of the valve, so that the rods operate as tappet-rods. Rods or cords *t* are attached to the arms for operating the valves by hand.

N is a spring in the rear part of the cylinder D, which presses the governor-piston forwardly in the said cylinder.

P is a relief-valve of any approved construction connected to the middle part of the cylinder D between the two pistons. This valve can be closed or can be set to let the air out gradually from the space between the two pistons.

The operation of the devices is as follows: The compressed air in the cylinder D normally holds the trolley-head in contact with the line-wire. When the trolley leaves the line-wire accidentally, the piston *d* is moved rearward suddenly by the compressed air and also moves the governor-piston backward, as the air does not have time to escape through the relief-valve P if the said valve is set with a small opening. The rearward motion of the governor-piston operates the tappet-rods *j* and *k* and causes them to close the air-inlet valve G and to open the air-outlet valve H. The trolley-pole at once drops by gravity and forces the piston *d* forward in its cylinder.

The trolley-pole remains in its lowered position with its head clear of the wire and its supports until the car comes to a standstill, because when the governor-piston moves forward the slots of the tappet-rods slide over the pins on the arms which operate the valves G and H, and the said valves are not operated prematurely. The spring moves the governor-piston forward, and its motion is regulated by the relief-valve P.

The valve-arms are operated by hand to reopen the valve G and close the valve H, so that the parts are restored to their normal positions. This is done because if the action were wholly automatic the trolley-pole would continue to rise and fall periodically instead of remaining in its lower position.

In the modification shown in Figs. 3 and 4 the governor-piston is dispensed with. The piston-rod E' of the cylinder is connected direct to the arm which supports the trolley-pole by means of pivoted connecting-links F'. The tappet-rods j' and k' are operatively connected with valves G' and H', as hereinbefore described, and are connected to the piston-rod E' or other similar part which has a longitudinal movement. A stuffing-box s is provided for the piston-rod on the front end of the cylinder, and t is a guide for the piston-rod in front of the said stuffing-box.

In Figs. 3 and 4 the valve-arms n' are not shown in their normal positions, but in the positions to which they are pushed back when the trolley-head leaves the line-wire. The trolley-pole is shown as having fallen back to its normal level. In falling to its lower level it may partially move back the arms n'; but it should not do so to a sufficient extent to reopen the valve G' and close the valve H'.

The operation of the devices shown in Figs. 3 and 4 is substantially the same as the operation of the devices shown in Figs. 1 and 2. The piston slides back suddenly when the trolley leaves the line-wire, and the trolley-pole drops by gravity when the valve G' is closed and the valve H' opened by the action of the two tappet-rods.

What I claim is—

1. In a trolley-stand, the combination, with a pivoted support, and an air-cylinder carried by it; of a trolley-pole arm pivoted to the said support between its vertical axis and the said cylinder, and a piston slidable in the said cylinder and operatively connected with the said arm at a point above its pivot.

2. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, a piston slidable in the said cylinder and operatively connected with the said arm, an air-outlet valve on the said cylinder, and a tappet operated by the said piston and opening the said valve and relieving

the air-pressure in the cylinder when the trolley-head leaves the line-wire.

3. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, a piston slidable in the said cylinder and operatively connected with the said arm, an air-inlet valve and an air-outlet valve carried by the said cylinder, and tappet mechanism which operates the said valves automatically when the trolley-head leaves the line-wire.

4. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, a piston slidable in the said cylinder and operatively connected with the said arm, an air-inlet valve and an air-outlet valve carried by the said cylinder, a governor-piston also slidable in the said cylinder, and tappet mechanism for operating the said valves operatively connected with the said governor-piston.

5. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, two pistons slidable in the said cylinder, valve mechanism for controlling the air in the cylinder, connections between one piston and the said arm and between the other piston and the said valve mechanism, and a relief-valve connected with the space in the cylinder between the two said pistons.

6. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, valve mechanism for controlling the air in the cylinder, a piston slidable in the cylinder and provided with a piston-rod which projects at the rear end of the cylinder, a cross-head on the said piston-rod, connecting-rods between the said cross-head and arm, and tappet mechanism which operates the said valve mechanism automatically when the trolley-head leaves the line-wire.

7. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, a piston slidable in the said cylinder and operatively connected with the said arm, valve mechanism for controlling the air in the cylinder, a governor-piston also slidable in the said cylinder, means for pressing the governor-piston toward the aforesaid piston, and tappet mechanism for operating the said valve mechanism connected with the said governor-piston.

8. In a trolley-stand, the combination, with a support, and a trolley-pole arm pivoted to the said support; of an air-cylinder carried by the said support, a piston slidable in the said cylinder and provided with a piston-rod

which projects at the rear end of the cylinder, connections between the said piston-rod and arm, a governor-piston provided with a tubular piston-rod which slides on the aforesaid
5 piston-rod and in the said cylinder, valve mechanism for controlling the air in the front end of the cylinder, and tappet mechanism for operating the said valve mechanism connected

with the projecting end portion of the said tubular piston-rod. 10

In testimony whereof I have affixed my signature in the presence of two witnesses.

BONIFACE A. GRASBERGER.

Witnesses:

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H. B. BOUDAR.